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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
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ART UNIT	PAPER NUMBER
2168	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,159	ZENG ET AL.	
	Examiner	Art Unit	
	AARON SANDERS	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35 and 37-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-31,33-35 and 37-40* is/are rejected.

7)☒ Claim(s) *11 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08/06/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17 November 2008 has been entered.

Response to Amendment

The amendment filed 9 October 2008 has been entered. Claims 1-35 and 37-40 are pending. Claims 1-3, 5, 8, 11, 13-15, 17, and 22-34 are currently amended. No claims are new. Claim 36 is cancelled.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of "determining a bid term" in claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing

should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

As per claim 1, it is unclear what limitation the phrase "based on attributes directly associated with the multi-type data objects" modifies. Further, "the multi-type objects of the same type" and the "the multi-type objects of different types" in the "identifying" steps lack antecedent basis in the claims.

As per claim 11, the phrase "the wherein the" in the "utilizing" step is incorrect.

As per claims 26, 29, and 35, "the at least one of the identified relationships" lacks antecedent basis in the claims.

As per claim 37, the phrase "means for aggregating to propagate data object relationships" is unclear.

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 13, 22, and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As per claim 1, the limitations "wherein the intra-layer relationships are based on an interconnection between the multi-type objects of the same type based on attributes directly associated with the multi-type data objects" and "wherein the inter-layer relationships are based on an interconnection between the multi-type objects of different types rather than attributes directly associated with the multi-type data objects" do not appear in the specification.

As per claim 13, the limitation of identifying relationships among multi-type data objects, where the identified relationships are intra and inter-layer relationships between sub-objects of the multi-type data objects, does not appear in the specification.

As per claims 22 and 34, the limitation of identifying intra and inter-layer relationships between multi-type data objects, where the identified relationships are between sub-objects of the multi-type data objects, does not appear in the specification.

As per claims 13, 22, and 34, the limitations "having an interconnection based on attributes directly associated with multi-type data objects" and "having an interconnection

between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects" do not appear in the specification.

Claim Rejections - 35 USC § 112, Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 11, 13, 22, 32, and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the limitation "wherein the intra-layer relationships are based on an interconnection between the multi-type objects of the same type" is unclear. The phrase "intra-layer relationships among homogeneous objects of the multi-type data objects" indicates that multi-type data objects are made up of sub-objects, at least some of these sub-objects are homogeneous (i.e. the same type, see Specification par. 18), and at least some of these sub-objects are related to each other. The phrase, "the intra-layer relationships are based on an interconnection between the multi-type objects of the same type" modifies the first phrase, but it is unclear what an "interconnection between the multi-type objects of the same type" and how the "intra-layer relationships" are based on it. The limitation "wherein the inter-layer relationships are based on an interconnection between the multi-type objects of different types" is also unclear for the same reason.

As per claims 13, 22, and 34, the limitations "having an interconnection based on attributes directly associated with multi-type data objects" and "having an interconnection

between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects" are unclear because it is not clear which limitations they modify.

Further, claims 1, 11, 13, 22, 32, and 34 are contradictory. Claim 1 identifies intra and inter-layer relationships between objects of the multi-type data objects. Claim 11 identifies relationships (presumably intra and inter-layer relationships) between multi-type data objects. Claim 13 identifies relationships between multi-type data objects based on intra and inter-layer relationships between objects of the multi-type data objects. Claims 22, 32, and 34 identify intra and inter-layer relationships between multi-type data objects.

The specification does not support all of these embodiments. Rather, it appears from the figures and the claims, as originally filed, that Applicant's process identifies intra and inter-layer relationships between multi-type data objects. These relationships may be based on the intra and inter-layer relationships between sub-objects of the multi-type data objects, but this is not clear. Thus, it is not clear which independent claim actually claims Applicant's invention.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-12, 34-35, and 37-40 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The process of claims 1 and 11 are not statutory because abstract ideas alone are not patentable. To be patentable, a process must have a practical application and (1) be tied to a

particular machine or (2) transform a particular article into a different state. *In re Comiskey*, 499 F.3d 1365, 1376-77 (Fed. Cir. 2007).

An algorithm that is only useful in connection with a computer is still not "tied" to a machine. *Gottschalk v. Benson*, 409 U.S. 63, 64, 71-72 (A method of converting binary-coded decimal numerals into pure binary numerals was "not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use" and would "wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself"). Rather, a claim reciting an algorithm is statutory only if, as employed in the process, "it is embodied in, operates on, transforms, or otherwise involves another class of statutory subject matter, i.e., a machine, manufacture, or composition of matter." *In re Comiskey*, 499 F.3d at 1376.

Here, the methods are clearly not tied to a particular machine, and insofar as returning relevant search terms to a user may transform a particular article, the claims do not recite the limitation positively. Rather, it is a use for the "utilizing" step. As such, the claims are not statutory.

Claims 34-35 and 37-40 are not statutory because they purport to recite a hardware system, but the claimed means have not been defined as hardware in the specification. The mere recitation in the preamble that claim 34 is directed to a hardware system is insufficient. Limitations in the preamble are not read into the claims unless the claimed elements refer back to the preamble. Here, that is not the case. Even if the preamble had patentable weight, it is unclear what elements are "implemented in hardware." Thus, the claims are not statutory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-35 and 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al., U.S. 2002/0165849 ("Singh"), in view of Schuetze et al., U.S. 2003/0110181 ("Schuetze"), in view of Turski et al., U.S. 2004/0255301 ("Turski"), and in view of Kleinberg, U.S. 6,112,202 ("Kleinberg").

1. Singh teaches "*A computer-implemented method comprising*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term.'"

Singh teaches "*determining a bid term, the bid term associated with multi-type data objects*," see par. 245, "In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

Singh teaches "*and utilizing, by a search term suggestion module, ... to respond to the bid term from a user with search terms relevant to the bid term*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*utilizing... the reinforced clusters*." Schuetze does, however, see Fig. 12 and par. 171, "A snapshot of the screen displaying five returned text

clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetza par. 35.

Singh does not teach "*identifying intra-layer relationships among homogeneous objects of the multi-type data objects, wherein the intra-layer relationships are based on an interconnection between the multi-type objects of the same type based on attributes directly associated with the multi-type data objects*." Kleinberg does, however, see Fig. 2, step 26, Fig. 3, and col. 7, l. 55 – col. 8, l. 5, "Step 8 of FIG. 2 states that we begin with the set P of pages produced by step 4. That set is shown collectively as 10 in FIG. 3. Individual pages 12 are shown schematically as small circles. Hyperlinks 14 are shown as arrows… In step 16, a set Q (shown as 18 in FIG. 3) is obtained, consisting of all pages 12 which are pointed to by the pages 12 in the set P 10… In step 20, a set R (shown as 22 in FIG. 3) is obtained, consisting of all pages 12 which point to the pages 12 in the set P 10." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

Singh does not teach "*identifying inter-layer relationships among heterogeneous objects of the multi-type data objects, wherein the inter-layer relationships are based on an interconnection between the multi-type objects of different types rather than attributes directly associated with the multi-type data objects*." Turski does, however, see Figs. 3-4, par. 38, "Each row in association table 302 associates two objects, obj1 and obj2… The values of entries in obj1 field 312, obj2 field 314, and objA field 316 of association table 302 are the unique identifiers for those respective objects stored in a data field 318 and identified with id field 308 in object table 304," and par. 40, "The associated objects (obj1, obj2) represented in obj1 field 312 and obj2 field 314 can be of arbitrary type." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

Singh does not teach "*iteratively, by a reinforced clustering algorithm, clustering the multi-type data objects by the intra-layer relationships and the inter-layer relationships to generate reinforced clusters*." Schuetze does, however, see par. 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features" and par. 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because

Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

2. Singh does not teach "*The method of claim 1, wherein the inter-layer relationships include at least one of content related information, user interest in an associated topic, and user interest in an associated Web page*." Turski does, however, see par. 17, "As described below, context associations between the objects may include similarities between them and their importance. The importance of and similarities between objects may be determined from user computer interactions with the objects." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

3. Singh does not teach "*The method of claim 1, wherein the intra-layer relationships include at least one of query refinement, recommended Web page, and relationship between respective users*." Kleinberg does, however, see col. 5, ll. 4-12, "For instance, in a population of computer network users, links may take the form of E-mail messages from one user to another. The invention may be practiced to define communities of users, within the population, which communicate with each other a lot, or to identify individual users, which are authoritative sources of information, based on the number of E-mail messages they receive, and from whom they are received." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

4. Singh teaches "*The method of claim 1, wherein each of the multi-type data objects are related to at least one of a search query data object type, a selected Web page type, and a user information type*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term'. In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

5. Singh does not teach "*The method of claim 1, wherein the inter-layer relationships include a first weighting scheme and the intra-layer relationships include a second weighting scheme different than the first weighting scheme to indicate importance to associated objects of the multi-type data objects*." Kleinberg teaches "*the intra-layer relationships include a second weighting scheme different than the first weighting scheme to indicate importance to associated objects of the multi-type data objects*," however, see col. 4, ll. 53-65, "Then, authoritativeness information is obtained for the pages of the initial set. The authoritativeness information exists on a per page basis, and is related to the number of links to or from the page." Turski teaches "*the inter-layer relationships include a first weighting scheme... to indicate importance to associated objects of the multi-type data objects*," see par. 26, "In one implementation, association system 110 could be instructed to ignore certain types of similarity, or to weight one type of similarity more heavily than another."

6. Singh teaches "*The method of claim 1, wherein the identifying and the iteratively clustering are performed for search term suggestions*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On

Bidded Search Term'. In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

7. Singh does not teach "*The method of claim 1, wherein the iteratively clustering comprises propagating clustering results of a first iteration to all related data objects of the multi-type data objects, at least two of the related data objects being of heterogeneous data type, the propagating being used to enhance clustering of respective ones of the multi-type data objects in a second iteration of reinforced clustering operations*." Schuetze does, however, see par. 152, "Scatter/Gather iteratively refines a search by 'scattering' a collection into a small number of clusters, and then a user 'gathers' clusters of interest for scattering again. The Scatter/Gather method is extended by the invention to extend to a multi-modal, multi-feature method, using both text and image features to navigate a collection of documents with text and images." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

8. Singh does not teach "*The method of claim 1, wherein the iteratively clustering comprises determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of inter-object and intra-object content similarity and similarities between the inter-layer relationships and the intra-layer relationships*." Schuetze does, however, see par. 3, "an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the

teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

9. Singh does not teach "*The method of claim 1, wherein the iteratively clustering comprises merging related ones of the multi-type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see par. 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

10. Singh does not teach "*The method of claim 1, wherein the method further comprises mutually reinforcing an importance of individual ones of the multi-type data objects within an object type and between different object types*." Schuetze does, however, see par. 97, "The use of token, frequency weight and inverse context frequency weight for the embedding employed by the invention is consistent with the following intuitive description. Each additional occurrence of an element (or word, for example) in a context (e.g., a document) reflects an increased level of importance for that element as a descriptive feature." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

12. Singh teaches "*The method of claim 1, wherein the utilizing the reinforced clusters comprises: responsive to receiving the bid term from a user, comparing the bid term with a*

feature space of objects in the reinforced clusters," see par. 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*responsive to comparing, identifying one or more search term suggestions*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Singh teaches "*and communicating the search term suggestions to the user*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms to assist the advertiser in locating search terms relevant to the content of the advertiser's web site."

13. Singh teaches "*A computing device comprising*," see par. 189, "FIG. 1 is an example of a distributed system 10 configured as client/server architecture."

Singh teaches "*a processor*," see par. 192, "Each client 12 typically includes one or more processors."

Singh teaches "*and a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for*," see par. 192, "Each client 12 typically includes one or more… memories."

Singh teaches "*and utilizing, by a search term suggestion module, ... to respond to the bid term from a user with search terms relevant to the bid term*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented

in software." Singh does not teach "*utilizing... the reinforced clusters*." Schuetze does, however, see Fig. 12 and par. 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetza par. 35.

Singh does not teach "*identifying relationships among multi-type data objects, wherein the identified relationships include intra-layer relationships... such that: the intra-layer relationships are among homogeneous objects of the multi-type data objects having an interconnection based on attributes directly associated with multi-type data objects*." Kleinberg does, however, see Fig. 2, step 26, Fig. 3, and col. 7, l. 55 – col. 8, l. 5, "Step 8 of FIG. 2 states that we begin with the set P of pages produced by step 4. That set is shown collectively as 10 in FIG. 3. Individual pages 12 are shown schematically as small circles. Hyperlinks 14 are shown as arrows… In step 16, a set Q (shown as 18 in FIG. 3) is obtained, consisting of all pages 12 which are pointed to by the pages 12 in the set P 10… In step 20, a set R (shown as 22 in FIG. 3) is obtained, consisting of all pages 12 which point to the pages 12 in the set P 10." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have

allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

Singh does not teach "*identifying relationships among multi-type data objects, wherein the identified relationships include... inter-layer relationships such that... the inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects*." Turski does, however, see Figs. 3-4, par. 38, "Each row in association table 302 associates two objects, obj1 and obj2… The values of entries in obj1 field 312, obj2 field 314, and objA field 316 of association table 302 are the unique identifiers for those respective objects stored in a data field 318 and identified with id field 308 in object table 304," and par. 40, "The associated objects (obj1, obj2) represented in obj1 field 312 and obj2 field 314 can be of arbitrary type." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

Singh does not teach "*iteratively clustering the multi-type data objects by at least one of the identified relationships to generate reinforced clusters, each relationship of the relationships being weighted to indicate an importance to associated objects of the multi-type data objects*." Schuetze does, however, see par. 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features" and par. 43, "iterative clustering and selection of cluster subsets can help a user

identify images of interest," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

14. Singh does not teach "*The computing device of claim 23, wherein the inter-layer relationships include at least one of content related information, user interest in an associated topic, and user interest in an associated Web page*." Turski does, however, see par. 17, "As described below, context associations between the objects may include similarities between them and their importance. The importance of and similarities between objects may be determined from user computer interactions with the objects." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

15. Singh does not teach "The computing device of claim 13, wherein the intra-layer relationships include at least one of query refinement, recommended Web page, and relationship between respective users." Kleinberg does, however, see col. 5, ll. 4-12, "For instance, in a population of computer network users, links may take the form of E-mail messages from one user to another. The invention may be practiced to define communities of users, within the population, which communicate with each other a lot, or to identify individual users, which are authoritative sources of information, based on the number of E-mail messages they receive, and from whom they are received." Thus, it would have been obvious to one of ordinary skill in the

database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

16. Singh teaches "*The computing device of claim 13, wherein identifying and iteratively clustering are performed for search term suggestion*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term'. In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

17. Singh does not teach "*The computing device of claim 13, wherein the computer-program instructions for the iteratively clustering comprise instructions for aggregating data object relationships to related ones of the multi-type data objects based on content of the reinforced clusters*." Schuetze does, however, see par. 31, "Each modality within each document is described herein by an n-dimensional vector, thereby facilitating quantitative analysis of the relationships among the documents in the collection" where, see par. 76, "As illustrated in FIG. 1, each document (for example, an HTML document 110) chosen from a collection 120 maps to a set of feature vectors 112, one for each modality (for example, a text vector 114 and a URL vector 116)." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see par. 35.

18. Singh does not teach "*The computing device of claim 13, wherein the instructions for the iteratively clustering comprise instructions for determining a similarity between individual*

ones of the multi-type data objects, the similarity being a function of at least one of inter-object and intra-object content similarity and similarities between the at least one of the identified relationships." Schuetze does, however, see par. 3, "an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

19. Singh does not teach "*The computing device of claim 13, wherein the instructions for the iteratively clustering comprise instructions for merging related ones of the multi-type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see par. 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

20. Singh does not teach "*The computing device of claim 13, wherein the instructions for the iteratively clustering comprise instructions for iteratively clustering until all object types represented by the multi-type data objects converge*." Schuetze does, however, see par. 78, "the collection 120 comprises all known documents that will ever by [sic] processed by a system according to the invention" where the "process" is illustrated in Fig. 3 and where "converge" is defined in Applicant's specification paragraph par. 74 as, "each type of the different kinds of

nodes and links are examined to obtain structural information that can be used for clustering." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see par. 35.

21. Singh teaches "*The computing device of claim 13, wherein the utilizing the reinforced clusters comprises: responsive to receiving the bid term from a user, comparing the bid term with a feature space of objects in the reinforced clusters*," see par. 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*responsive to comparing, identifying one or more search term suggestions*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Singh teaches "*and communicating the search term suggestions to the user*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms to assist the advertiser in locating search terms relevant to the content of the advertiser's web site."

22. Singh teaches "*A computer-readable storage medium comprising computer-executable instructions executable by a processor for*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term.'"

Singh teaches "*and utilizing, by a search term suggestion module, ... to respond to a bid term from a user with terms relevant to the bid term*," see par. 245, "The system reads the search

term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*utilizing... the reinforced clusters*." Schuetze does, however, see Fig. 12 and par. 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and 1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetza par. 35.

Singh does not teach "*identifying intra-layer relationships and inter-layer relationships among multi-type data objects, wherein the intra-layer relationships are among homogeneous objects of the multi-type data objects having an interconnection based on attributes directly associated with multi-type data objects*." Kleinberg does, however, see Fig. 2, step 26, Fig. 3, and col. 7, l. 55 – col. 8, l. 5, "Step 8 of FIG. 2 states that we begin with the set P of pages produced by step 4. That set is shown collectively as 10 in FIG. 3. Individual pages 12 are shown schematically as small circles. Hyperlinks 14 are shown as arrows… In step 16, a set Q (shown as 18 in FIG. 3) is obtained, consisting of all pages 12 which are pointed to by the pages 12 in the set P 10… In step 20, a set R (shown as 22 in FIG. 3) is obtained, consisting of all pages 12

which point to the pages 12 in the set P 10." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

Singh does not teach "*identifying... inter-layer relationships among multi-type data objects... wherein the inter-layer relationships, are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects*." Turski does, however, see Figs. 3-4, par. 38, "Each row in association table 302 associates two objects, obj1 and obj2... The values of entries in obj1 field 312, obj2 field 314, and objA field 316 of association table 302 are the unique identifiers for those respective objects stored in a data field 318 and identified with id field 308 in object table 304," and par. 40, "The associated objects (obj1, obj2) represented in obj1 field 312 and obj2 field 314 can be of arbitrary type." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

Singh does not teach "*iteratively clustering the multi-type data objects by at least one of the relationships to generate reinforced clusters*." Schuetze does, however, see par. 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather

method is extended hereby to use multi-modal features" and par. 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

23. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the inter-layer relationships comprise at least one of content related information, user interest in an associated topic, and user interest in an associated Web page.*" Turski does, however, see par. 17, "As described below, context associations between the objects may include similarities between them and their importance. The importance of and similarities between objects may be determined from user computer interactions with the objects." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

24. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the intra-layer relationships comprise at least one of query refinement, recommended Web page, and relationship between respective users.*" Kleinberg does, however, see col. 5, ll. 4-12, "For instance, in a population of computer network users, links may take the form of E-mail messages from one user to another. The invention may be practiced to define communities of users, within the population, which communicate with each other a lot, or to identify individual users, which are authoritative sources of information, based on the number of E-mail messages they receive,

and from whom they are received." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

25. Singh teaches "*The computer-readable storage medium of claim 22, wherein each of the multi-type data objects are related to at least one of a search query data object type, a selected Web page type, and a user information type*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the advertiser to 'Get Suggestions On Bidded Search Term'. In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

26. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the at least one of the identified relationships are weighted to indicate an importance to associated objects of the multi-type data objects*." Turski does, however, see par. 26, "In one implementation, association system 110 could be instructed to ignore certain types of similarity, or to weight one type of similarity more heavily than another." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

27. Singh teaches "*The computer-readable storage medium of claim 22, wherein identifying and iteratively clustering are performed for search term suggestion*," see par. 245, "Preferably, the 'Account Management' menu 170 of FIG. 2 provides a selection for the

advertiser to 'Get Suggestions On Bidded Search Term'. In this case, the advertiser enters a bidded search term into a form-driven query box displayed to the advertiser."

28. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the iteratively clustering comprises propagating clustering results of a first iteration to all related data objects of the multi-type data objects, at least two of the related data objects being of heterogeneous data type, the propagating being used to enhance clustering of respective ones of the multi-type data objects in a second iteration of reinforced clustering operations*." Schuetze does, however, see par. 152, "Scatter/Gather iteratively refines a search by 'scattering' a collection into a small number of clusters, and then a user 'gathers' clusters of interest for scattering again. The Scatter/Gather method is extended by the invention to extend to a multi-modal, multi-feature method, using both text and image features to navigate a collection of documents with text and images." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

29. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the iteratively clustering comprises determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of object content similarity and similarities between the at least one of the identified relationships*." Schuetze does, however, see par. 3, "an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of

the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

30. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the iteratively clustering comprises merging related ones of the multi-type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see par. 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

31. Singh does not teach "*The computer-readable storage medium of claim 22, wherein the instructions further comprise instructions for mutually reinforcing an importance of individual ones of the multi-type data objects within an object type and between different object types*." Schuetze does, however, see par. 97, "The use of token, frequency weight and inverse context frequency weight for the embedding employed by the invention is consistent with the following intuitive description. Each additional occurrence of an element (or word, for example) in a context (e.g., a document) reflects an increased level of importance for that element as a descriptive feature." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

33. Singh teaches "*The computer-readable storage medium of claim 22, wherein utilizing the reinforced clusters comprises: responsive to receiving the bid term from a user, comparing the bid term with a feature space of objects in the reinforced clusters*," see par. 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*responsive to the comparing, identifying one or more search term suggestions*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Singh teaches "*and communicating the search term suggestions to the user*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms to assist the advertiser in locating search terms relevant to the content of the advertiser's web site."

34. Singh teaches "*A system implemented in hardware, the system comprising*," see par. 189, "FIG. 1 is an example of a distributed system 10 configured as client/server architecture."

Singh teaches "*and means... to respond to a bid term from a user with terms relevant to the bid term*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms… Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software." Singh does not teach "*means for utilizing the reinforced clusters*." Schuetze does, however, see Fig. 12 and par. 171, "A snapshot of the screen displaying five returned text clusters 1216, 1218, 1220, 1222, and

1224 is shown in the left half of FIG. 12. These clusters are the clusters closest to the query terms… The user decides to scatter the first text cluster containing the terms 'ancient' and 'cathedral' again based on text… As described above, this causes the system to refine the existing selected cluster into smaller separate clusters," where the claimed "reinforced clusters" are the referenced "Text Clusters 1-5." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetza par. 35.

Singh does not teach "*means for identifying relationships between multi-type data objects, the identified relationships including intra-layer relationships… wherein the intra-layer relationships are among homogeneous objects of the multi-type data objects having an interconnection based on attributes directly associated with multi-type data objects*." Kleinberg does, however, see Fig. 2, step 26, Fig. 3, and col. 7, l. 55 – col. 8, l. 5, "Step 8 of FIG. 2 states that we begin with the set P of pages produced by step 4. That set is shown collectively as 10 in FIG. 3. Individual pages 12 are shown schematically as small circles. Hyperlinks 14 are shown as arrows… In step 16, a set Q (shown as 18 in FIG. 3) is obtained, consisting of all pages 12 which are pointed to by the pages 12 in the set P 10… In step 20, a set R (shown as 22 in FIG. 3) is obtained, consisting of all pages 12 which point to the pages 12 in the set P 10." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Kleinberg's teachings would have allowed Singh's method to narrow a large set of search results into a smaller, more relevant set of search results, see Kleinberg col. 3, ll. 55-59.

Singh does not teach "*means for identifying relationships between multi-type data objects, the identified relationships including... inter-layer relationships... wherein the inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects*." Turski does, however, see Figs. 3-4, par. 38, "Each row in association table 302 associates two objects, obj1 and obj2… The values of entries in obj1 field 312, obj2 field 314, and objA field 316 of association table 302 are the unique identifiers for those respective objects stored in a data field 318 and identified with id field 308 in object table 304," and par. 40, "The associated objects (obj1, obj2) represented in obj1 field 312 and obj2 field 314 can be of arbitrary type." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

Singh does not teach "*means for iteratively clustering the multi-type data objects by at least one of the identified relationships to generate reinforced clusters*." Schuetze does, however, see par. 35, "Using the system, a user progressively narrows a collection to a small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except the Scatter/Gather method is extended hereby to use multi-modal features" and par. 43, "iterative clustering and selection of cluster subsets can help a user identify images of interest," where the claimed "reinforced clusters" are the referenced "cluster subsets." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine

the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

35. Singh does not teach "*The system of claim 34, further comprising means for weighting the at least one of the identified relationships to indicate an importance to associated objects of the multi-type data objects*." Turski does, however, see par. 26, "In one implementation, association system 110 could be instructed to ignore certain types of similarity, or to weight one type of similarity more heavily than another." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see Turski par. 6.

37. Singh does not teach "*The system of claim 34, wherein the means for iteratively clustering comprise means for aggregating to propagate data object relationships to related ones of the multi-type data objects based on content of the reinforced clusters*." Schuetze does, however, see par. 31, "Each modality within each document is described herein by an n-dimensional vector, thereby facilitating quantitative analysis of the relationships among the documents in the collection" where, see par. 76, "As illustrated in FIG. 1, each document (for example, an HTML document 110) chosen from a collection 120 maps to a set of feature vectors 112, one for each modality (for example, a text vector 114 and a URL vector 116)." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see par. 35.

38. Singh does not teach "*The system of claim 34, wherein the means for iteratively clustering comprise means for determining a similarity between individual ones of the multi-type data objects, the similarity being a function of at least one of object content similarity and similarities between the at least one of the identified relationships*." Schuetze does, however, see par. 3, "an efficient scheme for assigning data objects in a collection to clusters based on similarities in their contents and characteristics." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

39. Singh does not teach "*The system of claim 34, wherein the means for iteratively clustering comprise means for merging to combine related ones of the multi- type data objects to reduce feature space dimensionality of the related ones*." Schuetze does, however, see par. 33, "various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Schuetze's teachings would have allowed Singh's method to formulate a query poorly matched to the corpus, see Schuetze par. 35.

40. Singh teaches "*The system of claim 34, wherein the means for utilizing further comprises: means, responsive to receiving a term from a user, for comparing the term with a feature space of objects in the reinforced clusters*," see par. 245, "Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software."

Singh teaches "*and responsive to comparing, means for identifying one or more search term suggestions*," see par. 245, "The system reads the search term entered by the advertiser and generates a list of additional related search terms."

Allowable Subject Matter

Claims 11 and 32 would be allowable if amended to overcome the 35 U.S.C. 112 rejections and claim objections.

Response to Arguments

As per Applicant's argument that the drawings show all the steps of claim 1, the Examiner respectfully disagrees. The step of "determining a bid term" does not appear in the drawings.

As per Applicant's argument that claims 34-35 and 37-40 are statutory under 35 U.S.C. 101, the Examiner respectfully disagrees. The claims purport to recite a hardware system, but the claimed means have not been defined as hardware in the specification. The mere recitation in the preamble that claim 34 is directed to a hardware system is insufficient. Limitations in the preamble are not read into the claims unless the claimed elements refer back to the preamble. Here, that is not the case. Even if the preamble had patentable weight, it is unclear what elements are "implemented in hardware." Thus, the claims are not statutory.

As per Applicant's argument that Singh and Schuetze do not teach "identifying inter-layer relationships" as in claims 1, 13, 22, and 34, the Examiner agrees. Turski does, however, see Figs. 3-4, par. 38, "Each row in association table 302 associates two objects, obj1 and obj2…

The values of entries in obj1 field 312, obj2 field 314, and objA field 316 of association table 302 are the unique identifiers for those respective objects stored in a data field 318 and identified with id field 308 in object table 304," and par. 40, "The associated objects (obj1, obj2) represented in obj1 field 312 and obj2 field 314 can be of arbitrary type." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Turski's teachings would have allowed Singh's method to gain a representation of the context between objects of different types, see par. 6.

As per Applicant's argument that Singh and Schuetze do not teach "iteratively, by a reinforced clustering algorithm, clustering the multi-type data objects by the intra-layer relationships and the inter-layer relationships to generate reinforced clusters" as in claim 1, the Examiner respectfully disagrees. The claims do not define the term "reinforced clustering," thus the Examiner must apply the broadest reasonable interpretation to the term. Thus, the user interaction disclosed in Schuetze could be "reinforced clustering." Further, although Schuetze may not teach intra and inter-layer relationships, it would be obvious to cluster the multi-type data objects based on those layers in view of the other references cited.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Sanders whose telephone number is 571-270-1016. The examiner can normally be reached on M-F 9:00a-4:00p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Aaron Sanders/
Examiner, Art Unit 2168
28 January 2009